Digital technologies and partnerships for Sustainable Development Goals: A document analysis.

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Abstract. Digital governance is a central concern in global efforts to achieve the Sustainable Development Goals (SDGs). The United Nations (UN) emphasizes the potential of digital technologies and technological partnerships to address global challenges, while governments struggle to develop technology governance policies at a pace that keeps up with technological advancements. Problem: despite growing recognition of digital technologies and technological partnerships as key enablers of sustainable development, there is limited understanding of how they could be more effectively leveraged by governmental and non-governmental organizations to advance the SDGs. Approach: This study examines how the UN envisions the role of digital technologies and technological partnerships in advancing the SDGs and analyses these findings through the lens of Social Innovation Ecosystems (SIEs). Methods: A qualitative document analysis was conducted on six official UN documents (2022–2024) addressing digital technologies and technological partnerships in the SDGs context. Thematic and reflexive analysis was applied with iterative coding. Main results: Findings highlight priority issues such as AI regulation for child protection, ethical and inclusive AI governance, counterterrorism, and efforts to reduce digital inequality. Four thematic categories were generated, and analysis also reveals a dual focus: centralized governance and stringent regulation of emerging technologies — particularly AI — alongside a call for international cooperation, ecosystem-like partnerships, public digital goods, and open models. Conclusions: Some UN priorities present tensions, as strict governance structures may hinder the agility required for open collaboration, and vice versa. SIEs approach may offer a potential balance, enabling governments, corporations, academia, and civil society to co-create solutions, share resources, and scale social innovations while ensuring technological development and adoption aligns with human rights, digital equity, and the SDGs.

Keywords. United Nations, Sustainable Development Goals, Digital Technologies, Technological Partnerships, Governmental Partnerships, Social Innovation Ecosystems, Document Analysis.
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1. Introduction

On September 22, 2024, during the United Nations Summit of the Future, global leaders endorsed the Pact for the Future — a comprehensive agreement emphasizing digital governance as critical to tackling global challenges. A core element of this pact, the Global Digital Compact, underscores the strategic role of technology in fostering international cooperation and represents a commitment to digital governance and equitable, ethical digital development that benefits the whole society. The Pact recognizes science, technology, and innovation as key drivers of progress toward the Sustainable Development Goals (SDGs), stressing the need for cross-sector

partnerships to shape an inclusive, equitable, and sustainable future (United Nations, 2024). High innovation performance is essential for solving complex social problems and accelerating sustainable development (Lu & Wang, 2024). Social Innovation Ecosystems (SIEs) offer a promising model for organizing multi-actor collaboration (Ho & Yoon, 2022; Bucio-Mendoza & Solis-Navarrete, 2024). Digital technologies serve as enablers of innovation (Chueri et al., 2020; Soni et al., 2021; Ho & Yoon, 2022; Hu, Phillips & Wu, 2024), helping organizations scale solutions effectively. Given resource constraints across sectors, technological partnerships between governments, businesses, academia, and civil society are essential for knowledge sharing and resource mobilization (Parthasarathy, Dey & Gupta, 2021; Pinheiro, Chueri & Santos, 2021; Slitine, 2024). SIEs offer a structured yet adaptable environment well-suited to this collaborative approach (Lyulyoy et al., 2024).

Although digital technologies and partnerships are increasingly seen as essential to sustainable development, their effective use by public and private organizations to advance the SDGs remains underexplored. In November 2024, we conducted a systematic mapping study (Albuquerque & Siqueira, 2025) to examine the use of digital technologies in SIEs and compare them to the UN's technological priorities. Few studies offered detailed empirical insights, and most indicated low adoption, reinforcing the need to better understand how to design, integrate, and scale digital solutions in SIEs. Building on these findings, this study investigates how the UN approaches digital technologies and partnerships within the SDG context, exploring the alignment between governance, innovation strategies, and social impact. Such understanding may offer strategic guidance to strengthen cross-sector collaboration and ensure that technological progress supports global sustainable development.

The general objective is to investigate the UN's approach to the use of digital technologies and the formation of governmental and non-governmental technological partnerships to advance the SDGs. The specific objectives are:

- Identify UN's documents that address digital technologies or technological partnerships in SDGs context;
- Extract and analyze excerpts from these documents that mention the development, adoption, and/or use of digital technologies and/or technological partnerships;
- Characterize the UN's approach to digital technologies and technological partnerships;
- Identify priority and/or sensitive topics for the development, adoption, and/or use of digital technologies and/or for technological partnership articulation in the SDGs context;
- Analize the results in light of the Social Innovation Ecosystems approach.

To achieve the proposed objectives, the research questions (RQs) presented in Table 1 were defined.

Tab. 1 – Research questions.

ID	Question	Topic
RQ1	What is the UN's approach to the development, adoption, and/or use of digital technologies in the SDGs context?	The UN's approach to digital technologies in the SDGs context
RQ2	What is the UN's approach to governmental and/or non-governmental technological partnerships in the SDGs context?	The UN's approach to technological partnerships in the SDGs context
RQ3	What topics are presented as priority and/or sensitive issues for accelerating progress toward the SDGs?	Priority and sensitive topics

No studies were found that directly address the topics proposed in the RQs. However, some works explore indirectly related topics. For example, Chueri et al. (2020) conducted an in-depth study on real social innovation ecosystems in Brazil, examining digital platforms for coordination and collaboration, addressing economic and social aspects, though without explicit reference to the SDGs. Chaudhuri et al. (2024) investigated the role of Industry 4.0 technologies in fostering data-driven organizational culture and improving performance and innovation. However, their focus lies on competitive advantage in traditional organizations rather than social innovation. Wamba et al. (2021) conducted a literature review on artificial intelligence (AI) for social goals, exploring how AI research can support technology-driven social change and the creation of a "good AI society." Still, their scope is limited to AI, excluding partnerships or other technologies. These studies offer valuable insights but do not address the specific gap targeted in this research.

1.1 Conceptual foundations

The SDGs comprise 17 objectives outlined in the 2030 Agenda (United Nations, 2015), a plan of action adopted by the UN in 2015 as a universal call to eradicate poverty, protect the planet, and ensure peace and prosperity for all by 2030. Their implementation is driven by a Global Partnership for Sustainable Development, emphasizing solidarity and prioritizing the needs of the most vulnerable, with the engagement of all countries, stakeholders, and individuals. The interconnected and integrated nature of the SDGs is essential for achieving the Agenda's goals. According to the UN, fulfilling the SDGs requires effective use of technology and strong national innovation

capacities. This involves enhancing technological capabilities in developing countries and coordinating actors engaged in social innovation (United Nations, 2024). The United Nations Trade and Development (UNCTAD), the UN's focal point for Science, Technology, and Innovation (STI), aims to boost STI capacities in developing countries and support their integration into national development strategies. This helps countries leverage STI for progress, job creation, and sustainable development (United Nations Economic and Social Council, 2024; United Nations Trade and Development, 2023). UNCTAD emphasizes the potential of frontier technologies — emerging technologies with high impact and growth potential that benefit from digitalization and connectivity. While these technologies can accelerate sustainable development, they also pose risks such as rising inequality, job displacement, and ethical concerns (United Nations Trade and Development, 2023). UNCTAD's reports recommend actions to maximize benefits and mitigate risks, and stress the importance of international cooperation to treat such technologies as global public goods. Its latest Innovation and Technology Report (United Nations Trade and Development, 2023) highlights 17 frontier technologies essential for achieving the SDGs, including eight digital ones: AI, internet of things (IoT), big data, blockchain, 5G, 3D printing, robotics, and drones. UNCTAD notes that many of these are still largely inaccessible in developing regions, reinforcing its mission to strengthen their technological capacities (United Nations, 2024).

Social innovation could be defined as a novel process or solution that addresses a social issue more effectively, efficiently, sustainably, or equitably than existing alternatives, delivering value primarily to society rather than individuals (Phills Jr. et al., 2008; Beckman et al., 2023). The concept of Social Innovation Ecosystems (SIEs) captures the dynamics of such innovations through various ecosystem configurations. Typically, definitions describe the creation and diffusion of social innovations as distributed, co-produced processes. These ecosystems, formed by networks of actors, are vital for supporting innovative social initiatives and fostering new societal relationships. Pel et al. (2019) propose a relational framework with three empowerment dimensions in SIEs: local embedding, referring to rootedness in specific regions; translocal connectivity, the linking of diverse contexts to amplify impact; and discursive resonance, the legitimization of concepts through shared narratives that grant political and scientific authority. These dimensions operate at various intensities and scales, addressing both local and broader needs, and promoting more integrated and effective social innovation.

Besides this introduction section, this paper is organized as follows: Section 2 presents the research methods; Section 3 presents the results; Section 4 presents the discussion; and Section 5 presents the conclusion with final considerations.

2. Research Methods

This study adopts document analysis, a method suitable for accessing data that would otherwise be difficult or impossible to obtain. It involves extracting and analyzing data from various types of documents, including books, journals, institutional reports and photographs (Morgan, 2022). According to Morgan's (2022) classification, the approach here is qualitative, aiming to interpret how the UN, as an institutional actor, frames the role of technologies and partnerships in advancing the SDGs. It is also descriptive, as it focuses on identifying explicit meanings in the documents, rather than latent ones.

2.1 Document Selection Strategy

The analyzed documents were official UN documents, in English, issued by the General Assembly and select technical or advisory bodies, explicitly addressing digital technologies or technological partnerships for advancing the SDGs. Documents were retrieved from the official UN's website (https://www.un.org). Document selection, data collection and extraction were conducted in November and December 2024. Inclusion criteria prioritized relevance to this study—specifically, documents discussing the development, adoption, and/or use of digital technologies or the establishment of technology partnerships within the SDG context. Eligible document types included treaties, agreements, guidelines, reports, roadmaps, and statements, as well as resolutions or cover letters related to the selected documents (when available). Only documents published from 2015 onward—the launch year of the 2030 Agenda—were considered, with the most recent versions selected. Exclusion criteria ruled out opinion or news articles, documents that were not explicitly directed at the study's scope, drafts, and redundant materials (e.g., executive summaries of already selected full documents).

2.2 Search Strategy

The search followed a navigational browsing approach on the official UN's website, starting from the Global Digital Compact webpage (Table 2). Documents were skimmed to assess potential relevance. An iterative snowballing technique was applied—if a selected document cited another that met the criteria, it was reviewed for inclusion. Additional sections of the website were also explored. Final selections were drawn from the webpages listed in Table 2.

Tab. 2 – United Nations webpages where documents were selected.

Webpage	Link
Global Digital Compact	https://www.un.org/en/summit-of-the-future/global-digital-compact
HLAB on Artificial Intelligence	https://www.un.org/ai-advisory-body
Roadmap for Digital Cooperation	https://www.un.org/en/content/digital-cooperation-roadmap

Based on the reading of these documents, additional documents were selected using the 'snowball' search method. After another round of inclusion and exclusion criteria, the final list of documents was defined (Table 3).

Tab. 3 - Final list of selected documents.

Document title (and citation)	Document type
Implementing the Secretary-General's Roadmap for Digital Cooperation (Office of the Secretary-General, 2022)	Non-binding roadmap
Declaration on Future Generations (United Nations, 2024, pp. 52-56)	Non-binding political declaration
Governing AI for Humanity: final report (United Nations AI Advisory Board, 2024).	Report
Global Digital Compact (United Nations, 2024, pp. 37-51)	Non-binding agreement
Letter from the President of the General Assembly (United Nations General Assembly, 2024)	Cover letter
The Pact for the Future (United Nations, 2024, pp. 1-36)	Non-binding agreement

2.3 Data Collection and Extraction

Documents were downloaded in PDF format from the official UN website and stored in a public cloud folder. Data were manually extracted by reading and identifying excerpts explicitly related to the research questions. These excerpts were compiled into spreadsheets with the fields shown in Table 4. As this is a qualitative study, the analysis phase required revisiting the data to extract additional excerpts that could refine, support, or challenge researchers' insights.

Tab. 4 – Spreadsheet fields for the data extraction stage.

Field name	Field description
ID_doc	Document identifier, defined as an abbreviation of the document title.
Document_title	Original title of the document.
Year	Publication year.
Initial_page	Page number where the extracted excerpt begins.
ID_excerpt	Unique code identifying the excerpt.
Excerpt	Selected excerpt, presented as a direct quotation.

2.4 Data Analysis

The analysis began by consolidating the data from the previous step (subsection 2.3) into a single spreadsheet, with additional fields shown in Table 5.

Tab. 5 – Additional spreadsheet fields for data coding and analysis stages.

Field name	Field description
Keywords	Words or expressions identified in the excerpts that were relevant for the research questions.
Coding_cycle_1	Descriptive codes assigned to each excerpt.
Coding_cycle_2	Thematic categories grouping the first-cycle codes.

Data analysis followed a reflexive thematic approach (Morgan, 2022), allowing the coding process to evolve iteratively with the researcher's interpretation. This method supports uncovering "unexpected meanings rather

than summarize the data" (p. 73). Procedures were based on the strategies outlined by Miles, Huberman, and Saldaña (2014). In the first coding cycle, descriptive codes were applied; in the second, these were grouped into thematic categories (Table 5). When needed, multiple codes were assigned to a single excerpt to better address the research questions.

3. Results

A total of 145 excerpts were extracted, coded, and organized into thematic categories. These categories were initially based on the RQs and refined during analysis. Four final categories are presented in Table 6.

Tab. 6 – Thematic categories (after the second cycle of coding).

Category name	Category description
Digital technologies	Excerpts addressing digital technologies to advancing the SDGs.
Technological Partnerships	Excerpts addressing cross-sector collaboration to advancing the SDGs through digital technologies.
Global Cooperation	Excerpts addressing international cooperation by UN member states to advancing the SDGs through digital technologies.
Global Governance	Excerpts addressing the role of the UN in global governance of digital technologies.

Figure 1 shows the number of excerpts grouped into each thematic category after the second cycle of coding, and the following subsections present responses to each research question.

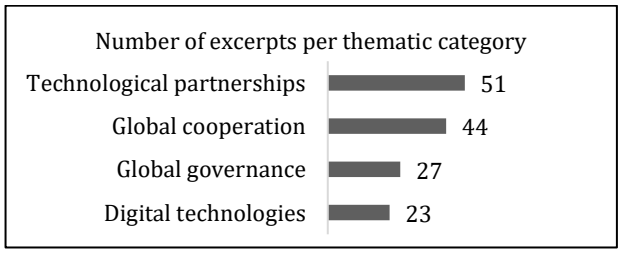

Fig. 1 - Number of excerpts per thematic category.

3.1 RQ1: The UN's approach to digital technologies in the SDGs context

To address this question, excerpts under "Digital Technologies" and "Global Governance" categories were analysed. The UN emphasizes digital technologies as transformative and accelerative tools for achieving the SDGs, stressing the need to reduce digital divides to ensure "no one is left behind." Key themes include digital inclusion, capacity building, data security, ethical AI governance, and human rights. Emerging technologies like AI are seen as essential for tackling global challenges, while unequal access is repeatedly cited as a major barrier. Governance of AI — whether globally centralized or regionally localized — is highlighted as critical to ensuring human rights and global well-being. Several excerpts warn of the risks of AI misuse, including terrorism, criminal use, psychosocial harm to children and youth, gendered digital inequality, and the dangers of unregulated technologies.

3.2 RQ2: The UN's approach to technological partnerships in the SDGs context

To explore this question, excerpts under "Global Cooperation" and "Partnerships" were analyzed. The UN advocates for digital cooperation through cross-sectoral, intergovernmental, and international partnerships. These are seen as essential to addressing complex challenges, guiding technological development, and maximizing benefits. Emphasis is placed on agility, adaptability, and collaborative ecosystems that enable knowledge and resource sharing. International cooperation is promoted as key to strengthening technological capacities and ensuring equitable access, especially for vulnerable populations. Two distinct contexts emerged in the data: a) Technological Partnerships, which involves multisector collaboration (governments, private sector, academia, civil society) to innovate and implement digital solutions tailored to community needs, usually in local or regional level (e.g., education, health, infrastructure); and Global Cooperation, which refers to international intergovernmental coordination in addressing transnational challenges (e.g., cybersecurity, poverty, terrorism). This cooperation is essential for policy alignment, capacity building, and collective responses to global threats. The UN positions this collaboration as a cornerstone of digital security and global stability in an unequal yet interconnected world.

3.3 RQ3: Priority and sensitive topics

To address this question, keywords across all thematic categories were analyzed to identify priority and/or sensitive topics. In the "Digital technologies" category, priorities include digital inequality, innovation, digital

inclusion, and the responsible AI use. In "Global Cooperation", digital and resource inequality between countries — particularly those in the Global South, Africa, island nations, and landlocked countries — stands out. In "Technological Partnerships", key issues include the lack of governance, discrepancies in regulations and insufficient technological capabilities. In "Global Governance", the risks associated with the improper use of AI and other emerging technologies were prioritized. Sensitive topics include AI regulation for child protection, with concerns about its effects on mental health, attachment, and cognitive development. Ethical and inclusive AI governance is seen as essential to ensuring equitable and ethical outcomes. Gender digital inequality is also addressed, with initiatives focused on empowering women. A strong emphasis is placed on safeguarding vulnerable groups and ensuring inclusive technological progress. Other sensitive themes include counterterrorism, preventing digital crimes, and reducing digital violence — all identified as urgent challenges requiring effective governance and international cooperation to uphold human rights and global security.

4. Discussion

The data analysis provides a broad view of how the UN approaches digital technologies and partnerships in the context of the SDGs, emphasizing global and local articulation across governmental and non-governmental sectors, responsible, inclusive, and ethical innovation, the defense and promotion of human rights, the reduction of inequalities, attention to vulnerable and marginalized groups, and centralized global governance. Table 7 summarizes the key findings, articulating the RQs and the thematic categories that emerged through the analysis. A distinguishing feature of this set of documents, compared to older UN reports, is that Global Digital Compact, Declaration on Future Generations, and Pact for the Future bring the perspectives of the Global South — particularly Latin America and Sub-Saharan Africa — to the center of the discussion, highlighting their goals, challenges, and interests. The approach reflects a strategy that combines centralization through global governance with the flexibility of partnerships among member states and regional partnerships involving various sectors of society. It also demonstrates a concern for avoiding the cultural imposition of world superpowers values at the expense of the Global South. The UN adopts a strong centralized governance approach, promoting the idea of a robust global governance system that transcends borders and ensures universal standards for the development and use of digital technologies. This global approach is prioritized over regional or local governance models to ensure consistency and effectiveness in technological policies worldwide. Global governance is seen as fundamental for establishing ethical guidelines, protecting human rights, and ensuring that the benefits of digital technologies are distributed equitably and responsibly, preventing asymmetries and exclusions.

Tab. 7 – Summary of key findings.

Research Question	Thematic Categories	Highlighted Topics
RQ1: The UN's approach to digital technologies in the SDGs context	Digital Technologies	Digital inequality; digital inclusion; technological innovation; AI accelerating SDGs; responsible AI use.
	Global Governance	Global coordinated AI governance; inclusive and ethical use of AI and other emerging technologies; human rights protection; children's safety.
RQ2: The UN's approach to technological partnerships in the SDGs context	Technological Partnerships	Local innovation; regional innovation; cross-sector collaboration; digital infrastructure; solutions tailored to community needs; scaling and replicating solutions.
	Global Cooperation	State-led international collaboration to global digital threats; capacity building; resource sharing; cybersecurity; counterterrorism; policy alignment.
RQ3: Priority and sensitive topics	All categories	Gender inequality; children's safety; digital violence; disparities in digital governance across nations and the lack of global digital governance; Global South, Africa, island, and landlocked nations inclusion.

However, some delicate issues stand out. The documents present several challenges that require agile solutions. Yet, many of the recommendations and guidelines rely on global decisions and actions (e.g., AI governance). But what happens in the absence of consensus? Assembly-based decisions can be slow, potentially reducing the agility needed to address urgent challenges. On the other hand, if decisions are made by a small group of member states, how well will these decisions reflect the needs of other countries? The same concern applies to large technology corporations that dominate the development of emerging technologies. Without digital regulation, their power becomes disproportionate, potentially exacerbating digital injustice and inequality. But how should such regulations be structured? Local and regional regulations can be more agile and better suited to specific contextual issues. Yet, power imbalances and injustices related to technology regulation could persist. This tension between the "global" and the "local" permeates the discussion of the most delicate issues, as seen across the analyzed documents.

Regarding the articulation between technological partnerships and Social Innovation Ecosystems (SIEs) in the context of the SDGs: technological partnerships play a fundamental role in promoting social innovation. Collaboration between different sectors — such as governments, NGOs, businesses, and academia — is essential for creating innovative solutions to complex social problems in more effective, efficient, and sustainable ways. These partnerships mobilize resources, knowledge, and technologies, fostering environments conducive to the co-production of social innovations. In the context of SIEs, technological partnerships can support the local adoption of innovations, enabling region-specific initiatives that address local needs while allowing the sharing of critical resources with partners who may otherwise lack access. Furthermore, these partnerships promote translocal connectivity, linking different regions and contexts to amplify the impact of social innovations and encourage the exchange of knowledge and experiences among diverse communities. Discursive resonance — another dimension of SIEs — can also be strengthened through these partnerships, as they can facilitate the collective process of legitimizing innovative concepts, thereby granting them political and scientific authority. Through collaboration, the actors involved in technological partnerships can shape a discourse that supports and legitimizes innovative practices, facilitating the acceptance and adoption of new social solutions. These partnerships can be key components of SIEs, providing the infrastructure needed to develop integrated solutions for complex social challenges. This is particularly significant given that the adoption of technological resources still appears low in many SIEs, even in Global North countries (Ventorini & Siqueira, 2025). SIEs, in turn, offer a favorable environment for this collaboration, as they promote co-creation of solutions, knowledge exchange, and mutual learning between stakeholders. These partnerships are not limited to purely technical innovation. They also involve a commitment to digital inclusion, digital equality, human rights, governance and data security — all of which are fundamental to ensure the ethical and responsible use of technologies. The analysis revealed that, to address global challenges and promote sustainability, technological innovation must be accompanied by regulatory frameworks aligned with human rights and sustainable development goals. Technological partnerships can help implement such regulations locally while facilitating the exchange of best practices across countries and regions. By promoting international cooperation, technological partnerships not only support local adaptation of innovations but also help ensure that the benefits of technological progress are equitably distributed — reducing digital inequality, which remains a significant obstacle to achieving the SDGs. Moreover, technological partnerships within SIEs have strong potential for fostering translocal connectivity. The UN highlights the importance of global cooperation, particularly in areas such as cybersecurity and digital crime prevention. By encouraging collaboration between countries, these partnerships build networks that transcend borders and connect local ecosystems, allowing solutions developed in one region to be adapted and successfully applied in others. This is particularly relevant for initiatives involving emerging technologies like AI, which, as the UN points out, have a transformative impact on key areas of sustainable development — including health, education, and infrastructure. Translocal connectivity is essential for optimizing the impact of these innovations and ensuring that the solutions developed are meaningful and accessible across diverse cultural and economic contexts. Finally, the creation of a collective discourse that legitimizes social innovations — another central component of SIEs — can also be reinforced through technological partnerships. The analysis shows that AI and other emerging technologies often have the potential to generate profound psychosocial impacts, especially on vulnerable populations such as children and women. The ethical governance of these technologies, particularly regarding human rights, is a major concern for the UN. By bringing together different stakeholders, technological partnerships can help construct a shared discourse that legitimizes innovative practices and supports the inclusive adaptation and implementation of these technologies. This collective discourse, underpinned by robust global governance, can serve as a means for the acceptance and dissemination of innovative solutions — while ensuring that these solutions are inclusive and do not reinforce existing inequalities.

5. Conclusions

This study aimed to contribute to the understanding of the UN's approaches to digital technologies and technological partnerships within the context of the SDGs. It also aimed to analyze the data through the lens of SIEs approach. The document analysis revealed that the UN adopts a strong centralizing stance, emphasizing the need for global governance in the management of digital technologies, particularly AI, while seeking to promote inclusion and empowerment of the most vulnerable countries, especially in the Global South. Technological partnerships — both global and local — are seen as essential instruments for fostering social innovation, enabling cross-sector collaboration, including governmental and non-governmental institutions, to maximize the societal impact of digital solutions. The analysis also highlighted the importance of global cooperation in addressing challenges such as digital crimes, terrorism, and online violence — sensitive topics in UN guidelines. The articulation between governmental and non-governmental actors at global and local levels is regarded as a key driver for integrated and sustainable technological responses to complex social problems. However, the analysis identified tensions among UN priorities. Strict governance structures may limit the agility and flexibility required for open collaboration — and vice versa. The study suggests that the SIEs approach is particularly suitable in this context, as it provides a structured, agile, and flexible environment where governments, enterprises, academia, civil society, and other actors could collaborate to co-create solutions, share resources, and scale social innovations across different regions while enabling progressive levels of governance. Promoting strong partnerships, providing funding, and fostering technological development within SIEs may help ensure that governmental and non-

governmental institutions work together in a way where the rapid pace of technological advances aligns with human rights, digital equity and broader sustainable development goals.

For future research, it is recommended to include in document analysis the UN's evaluation and monitoring reports on the digital economy of one or more countries. Published periodically by UNCTAD, these reports present data on countries' technological capabilities, inclusive digitalization strategies, and other criteria monitored by the UN. It is also important to note that, on January 1st, 2025, the Office of the Secretary-General's Envoy on Technology transitioned to the United Nations Office for Digital and Emerging Technologies (ODET), leading to significant updates on the sector's website. Therefore, another suggestion for future studies is to incorporate the new resources and documents now accessible on the updated ODET website (https://www.un.org/digital-emerging-technologies/), which were not available at the time of this research.

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